

China's March on the 21st Century

Kurt M. Campbell, Editor • Willow Darsie, Editor



THE ASPEN INSTITUTE



A REPORT OF THE ASPEN STRATEGY GROUP
JOSEPH S. NYE, JR. AND BRENT SCOWCROFT, CO-CHAIRMEN

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DAY II

CHINA'S ENERGY CHALLENGE

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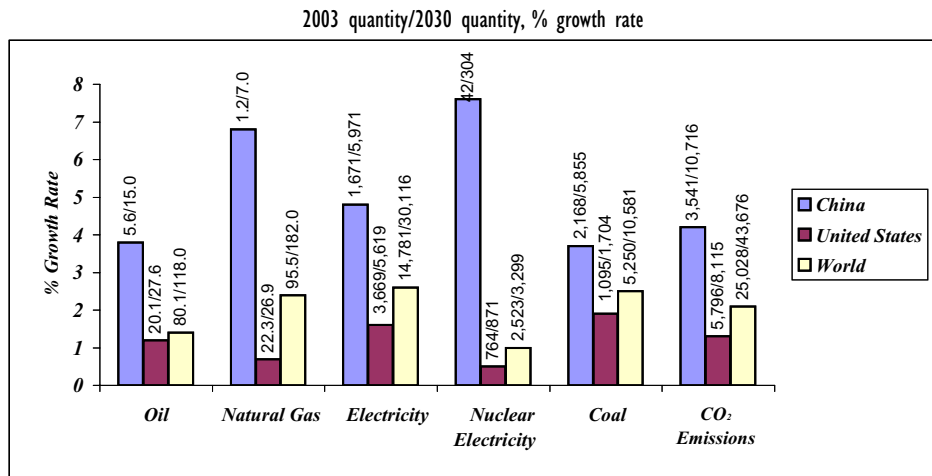


China's remarkable economic growth over the past two decades has enabled it to achieve social progress, has strengthened its geopolitical position, and has served as the lynchpin of the leadership's domestic political strategy. For the foreseeable future, China's leaders will continue to make economic growth a top priority.

As expected, this economic expansion has been accompanied by a corresponding surge in energy consumption. China became a net importer of oil in 1993, and it is now the world's third largest importer and second largest consumer. China has thus far been able to meet this increase in demand and prevent the economic slowdown that an energy shortage would precipitate.

However, the supply challenge is going to become greater for China in the years to come. We should anticipate that over the next few decades China's energy demand will grow between three and four times faster than that of the United States, as reflected in Figures I and II, below.

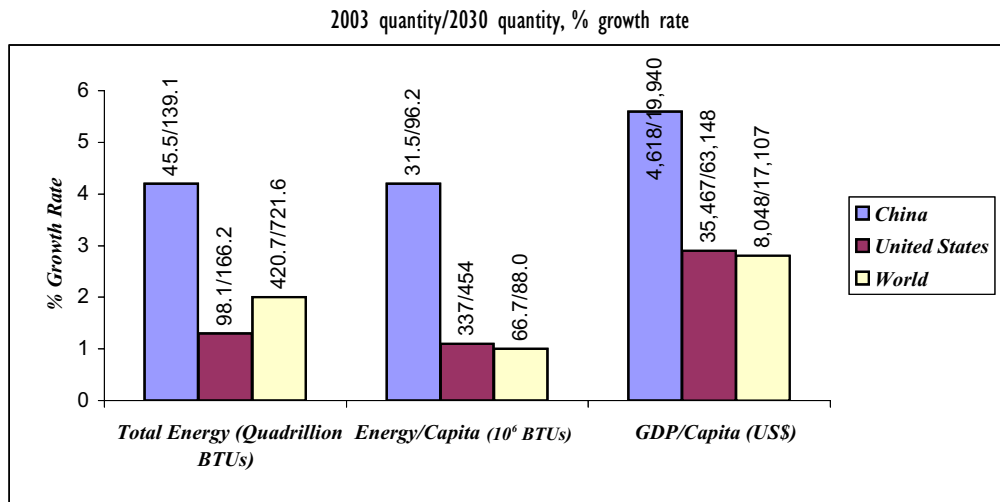
Figure I. Selected Energy Projections: China, the United States, and the World



Note: Units are as follows: million barrels/day (oil); trillion cu feet (natural gas); billion kWh (electricity); billion kWh (nuclear electricity); million short tons (coal); 106 metric tons (CO₂ emissions).

Source: Energy Information Administration (EIA) International Energy Outlook 2006, reference case projection

Figure II. Per Capita GDP & Energy Projections: China, the United States, and the World



Source: Energy Information Administration (EIA) International Energy Outlook 2006, reference case projection

CHINA'S ENERGY SECURITY CHALLENGES

The enormous projected growth in energy demand presents the Chinese government with at least three significant security challenges.

First, China will need to access international markets for ever more significant quantities of oil and natural gas. To date, China has sought whenever possible to avoid direct competition on the open market with the major international oil companies by arranging concessions in Iran, Sudan, and other countries where sanctions or other conditions limit or preclude open competition. China receives about 11 percent of its oil supply from Iran (which amounts to approximately a quarter of its total supply from the Middle East) and 5 percent of its supply from Sudan. China also relies on long-term, state-to-state contracts with major suppliers that include many non-market elements. In these arrangements, China is willing to pay a premium in order to lock up supply and avoid the international markets. It remains to be seen how its strategy will change as its energy needs grow.

Second, China must confront the security risks associated with the expansion of its nuclear sector. China's commercial nuclear power infrastructure is poised to grow by a factor of 7.5 between 2003 and 2030. Although its proven uranium reserves might be sufficient to meet this level of growth, China is in any event having little difficulty finding additional suppliers. It recently signed one such supply agreement with Australia. However, the risk of a nuclear power plant accident in the course of this expansion must not be overlooked. A serious, Chernobyl-scale accident would set back China's nuclear development and halt the growth of nuclear power worldwide. The non-proliferation threat, meanwhile, is now relatively small, as China has steadily committed itself to meeting the obligations of non-proliferation treaties and norms since the early 1990s.

Third, China is projected to emit ever-increasing quantities of carbon dioxide, sulfur dioxide, and other pollutants because of both its reliance on traditional coal power plants for electricity production and the growing demand for oil in its booming transportation sector.

At present, coal comprises approximately 65 percent of China's primary energy consumption, and it will continue to figure prominently in China's energy mix for years to come – perhaps even more so than is currently anticipated. The reason is simple: China has vast coal reserves and coal is cheap (about \$1 per MMBTU) compared to imported natural gas (about \$6 to \$7 per MMBTU at today's world price). Nuclear power, even with its massive expansion, is projected to provide only slightly more than 10 percent of Chinese electricity in 2030, while the projected growth of natural gas consumption – close to a six-fold increase in this same time period – is optimistic. The remainder of electricity demand, in addition to any shortfall on the nuclear or natural gas supply side, will largely be met by coal power plants.

Meanwhile, the rapid increase in the number of vehicles in China is contributing significantly to a rise in carbon emissions, and the situation is only going to get worse. The number of vehicles in China – already the world's third largest car market – is expected to increase six-fold or more by 2020.

GREEN CHINA?

The health and environmental threats posed by China's emissions are not purely domestic concerns. Clouds of sulfur and other pollutants from China's coal power plants are drifting offshore and affecting China's neighbors, and the impact of its carbon emissions on global warming is growing more severe each week. In 2005, China built about 75 large coal power plants, each of which emits about 15,000 metric tons of CO₂ each day.

Clouds of sulphur and other pollutants from China's coal power plants are now drifting offshore.

China's central government has demonstrated a growing awareness of the environmental burdens that accompany its current and projected pattern of energy use. Its latest five-year plan makes clear its intention to improve environmental quality, although just how far it is willing to go – and how much it is willing to pay – remains to be seen.

There are some areas in which progress is already underway. For instance, China has adopted measures to improve air quality in its cities by switching to natural gas and putting pollution control devices on coal power plants to control SO_x, NO_x, and particulate emissions.

China also has taken some steps to increase the efficiency of its automobile fleet. It has announced a tax of up to 20 percent for cars with poor gas mileage and emissions standards. This measure could help to ameliorate the rapid increase of urban pollution and, to a lesser extent, reduce oil demand in the transportation sector.

It is far less certain that China will move to market-based energy pricing, adopt demand-side management practices, moderate the growth of cars for personal use (rather than simply mandate greater vehicle efficiency), or pay the added cost of controlling carbon emissions from its coal plants.

One challenge that the central government faces is how to reconcile its need to control energy growth with local imperatives to maintain economic growth. The five-year plan has identified improved energy intensity as a preferred route, and there is ample room for progress in this area. China is far less energy efficient than either industrialized countries or some rapidly emerging ones (e.g., India). However, it is not making adequate investments – or using adequate technology – to

meet its goal of quadrupling GDP while only doubling energy consumption by 2020. Moreover, decision-making in the energy sector is decidedly a regional and provincial matter in China because it is the local authorities that have the responsibility to fuel the engine of economic growth. Tip O'Neill would remind us that in such a situation, the pace of change at the local level and the implementation of centrally mandated regulations are likely to be slow.

The least likely development is that China will choose to pay for the higher capital cost of electric power alternatives associated with carbon capture and sequestration. Consequently, carbon emissions will not be meaningfully constrained – and global warming will not be successfully combated – without some kind of international involvement in China's electric power sector.

GUIDING PRINCIPLES FOR U.S. POLICY TOWARD CHINA'S ENERGY GROWTH

The general principles that should guide U.S. policy are as follows.

- Energy security is just one interest – albeit an important one – that the United States must manage in its relationship with China. Other issues loom large (e.g., Taiwan, North Korea, human rights, trade, and intellectual property rights) and none of them can be considered wholly independently of one another.
- The United States must recognize that China has its own set of regional concerns and challenges involving energy. This manifests itself as acute energy and political competition with Japan (including a volatile dispute over oil and gas drilling rights in the East China Sea) and deepening energy ties with Russia (which is a serious source of concern in Europe, where Russia's long-term reliability as a major natural gas supplier is now in doubt).
- The United States has limited leverage on China to encourage modification of its energy policies. Proposals to use trade or investment restrictions (e.g., Export-Import Bank or World Bank-tied loans) to attempt to compel China to revise its energy policies are unrealistic and unlikely to be effective, particularly because China has no immediate capital needs.
- The United States must identify and explore mechanisms that go beyond the good intentions of “engagement and consultation.” The Bush administration's “responsible stakeholder” policy toward China is firmly rooted in this level of engagement, and its limitations are increasingly apparent.
- U.S. expectations should be based on what is feasible given China's internal politics and bureaucratic structure and the United States' own energy policy. To this end, the United States needs to develop an evolving model of energy decision-making in China in order to determine whether at a given point in time China is trending toward (1) a centrally controlled economy, (2) a competitive market-oriented economy, or (3) a highly decentralized economy with local actors making arrangements that meet local needs (e.g., local managers of a Chinese coal power plant will be told to add scrubbers to reduce sulfur emissions, but they will not be permitted to increase the price of electricity to cover the added cost of generation).
- The United States is seeking opportunities for constructive engagement on energy issues with other rapidly emerging economies – such as India, Indonesia, Mexico, and Brazil – but the political relationship with these nations is much less demanding than it is with China.

- The United States' own energy posture influences that of China. The response of the United States to the China National Offshore Oil Company's (CNOOC) bid for Union Oil Company of California (UNOCAL), for instance, helped to shape China's perception of the reliability of international oil markets. Similarly, the United States' lack of an aggressive domestic strategy for limiting carbon emissions influences China's approach to the issue of climate change.

U.S. POLICY OPTIONS

It is with these general principles in mind that we turn to the specific trends, challenges, and opportunities presented by China's energy policies in three key areas: oil and natural gas, nuclear energy, and carbon emissions from coal-fired power plants.

The Oil and Natural Gas Sector

Since 2004, there has been a dramatic increase in China's interest in gaining access to international oil and gas reserves. This would be unexceptionable if China were relying on transparent arrangements arrived at on market terms. If it chooses to overpay or take exceptional financial risk, so be it.

The problem from the perspective of the United States, however, is that China is increasingly entering into state-to-state arrangements with major resource holders that include significant non-market aspects, e.g., building airports, offering credit, tying foreign assistance to energy investment, and associating engineering and construction projects with energy supply deals. The states with which they have made such arrangements include Angola, Sudan, Iran, Algeria, and Saudi Arabia.

The net result of these non-market transactions is this: China is building political relationships that constrain the ability of the United States to pursue its interests in the Persian Gulf or with other major resource holders.¹

One such relationship that the United States must pay special attention to is that between Russia (a major resource holder that uses energy to gain political leverage) and China (a major oil and natural gas importer interested in locking up supply). As their energy relations warm, so too will their political relations, and it is patently not in the strategic interest of the United States for these two countries to become closely aligned. For instance, their joint membership in the Shanghai Cooperation Organization (SCO) – a regional security group that also includes Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyzstan – has already allowed them to increase their influence in Central Asia at the expense of the United States and other consuming countries. This could have significant energy security implications, as Central Asia serves as an important supplier of (and transit route for) oil and natural gas. Some observers believe that it was through the SCO that Russia and China successfully pressed for the eviction of U.S. forces from Uzbekistan in 2005.

China is increasingly entering into state-to-state arrangements with major resource holders that include significant non-market aspects.

China is far from the only Asian country in need of Russia's resources. The west-to-east transfer of oil and natural gas from Russia and Central Asia will need to be allocated between China, Japan, and other major consumers (such as South Korea, Taiwan, Thailand, and Vietnam). There will be fierce competition for these resources, and this competition will give Russia special opportunity to gain influence in the region. Russia has already proven adept at playing China and Japan off one another in the course of negotiations over the route of a proposed oil pipeline from Siberia.

In spite of the challenges, engagement with China on some oil and gas issues is important. To this end, the United States should lead efforts to do the following.

- Bring China into the International Energy Agency (IEA), either as a full member or as an informal partner. The IEA, an oil consumer group that among other things coordinates emergency responses in the event of supply disruption, cannot function effectively or efficiently when a major consumer like China is not a participant. Other large, rapidly growing emerging economies that are dependent on imported oil and gas, like India, should be included as well.
- Encourage China to acquire adequate national and industrial reserve stocks of crude oil and oil products. As an IEA member, China would be required to maintain strategic petroleum reserves equal to 90 days of net imports.
- Work with China to explain the advantages of open and transparent international oil and gas markets. China is distrustful because of the U.S. dominance of these markets, and CNOOC's thwarted bid for UNOCAL only served to reinforce this distrust.
- Establish transparent rules and regulations for foreign investment in and acquisition of U.S. energy assets. It is important that U.S. domestic political factors do not needlessly interfere with a fair and open international market, as was the case with CNOOC's failed bid for UNOCAL.
- Cooperate on energy infrastructure security issues. This includes developing a common understanding about naval operations to protect key sea lines of communication, the protection of key energy facilities (such as liquefied natural gas (LNG) terminals), and the use of Supervisory Control and Data Acquisition (SCADA) information security.
- Promote open access to pipelines in Central Asia (west-to-east and north-to-south) and expanded access to Russia's pipelines.
- Create an international biofuels market to reduce oil competition and provide new sources of energy outside of the Middle East. The United States can promote the development of an international alternative fuel markets by rapidly expanding its domestic demand for biofuels (e.g., mandating that all cars be flex-fuel vehicles that can run on high blends of ethanol or other liquid fuels derived from biomass) and phasing out the existing tariff on imported ethanol. China, which is unlikely to replace a significant amount of its food crops with energy crops, would be able to benefit from such an international market. Japan has already begun moving in this direction by importing ethanol from Brazil.

The Nuclear Energy Sector

China is a nuclear weapons state that possesses all of the elements required for nuclear power. China's ambitious goal for deploying nuclear power presents no direct security concern to the United States. However, there are some indirect effects that are potentially troubling.

- Should China decide to export nuclear fuel cycle technology – enrichment or reprocessing – to other countries, this would undermine our vital non-proliferation interests.
- Should China transfer commercial nuclear technology as part of its package of inducements in an energy deal with countries such as Algeria, Iran, or Saudi Arabia, this would pose a lesser but still significant proliferation threat.
- Should China in its rush to deploy power plants experience an accident, it would have a disastrous effect on the revitalization of commercial nuclear power throughout the world. This would undermine the global interest in assuring every country has access to safe nuclear power.

Carbon Emissions

In the mid term, managing the size of China's carbon emissions is the most important issue that the United States will face. If China and the other large, rapidly emerging economies do not control their carbon emissions, catastrophic global warming simply cannot be avoided – regardless of what steps are taken in Europe and the United States.

At the heart of the difficulty in reaching an agreement on emissions between developed countries (which have already emitted vast amounts of CO₂) and emerging countries (which are projected to emit vast amounts of CO₂) is the issue of equity. In other words, "Who pays?"

The United States can engage China on any of three levels.

- Promote involvement in the context of ongoing deliberations of the international climate change process. A first step would be for China to commit to meeting an energy intensity target. There exists within China a certain degree of pressure to make this type of "great nation" commitment, but little has come of it to date.
- Encourage clean energy technology transfers to China, as well as the construction of demonstration projects bearing on energy efficiency and carbon control. For instance, the United States could initiate carbon sequestration projects in China.²
- Transfer payments to cover all or a portion of the costs of carbon control in China for some period of time. CO₂ capture and sequestration costs about \$30 per ton of captured CO₂. Thus, it would cost some \$30 billion to prevent each gigaton of CO₂ emissions. China will be unwilling to pay the additional cost associated with carbon controlled energy production, which poses the question of whether the international community is willing and capable of paying for this difference.

In the mid term, managing the size of China's carbon emissions is the most important issue that the United States will face.

This last option is indeed the most direct and immediate solution to China's carbon emission problem, but it presents a serious, perhaps insurmountable, obstacle. While the international community might be willing to pay for a part of the cost of controlling China's emissions, this plan is feasible only if the United States and other large industrialized countries are willing to make an enormous, ongoing contribution. Given the relationship between the United States and China, it is difficult to imagine that a huge direct payment by the United States would be politically feasible. In addition, any U.S. financial assistance without conditions of some participation by U.S. industry and some degree of control over project selection and accountability is inconceivable. The possibility that the Chinese would accept such conditions is equally unlikely.

There is little chance of progress as long as the United States has no carbon control policy.

Indirect and less transparent payment mechanisms might enable the United States to circumvent the political obstacle. For instance, the United States could enter into an international cap-and-trade system in which U.S. businesses could purchase huge quantities of carbon credits from China. However, the magnitude of the transfer required might make it difficult to conceal the underlying economic cost to the United States. Moreover, devising a scheme that establishes a baseline from which carbon emission savings are measured is itself not easy.

Ultimately, if the United States fails to make significant progress with China on any of three levels outlined above, then the global warming timetable will be accelerated and the range of policy options for averting its impact will quickly narrow. It is time for the United States to develop serious policy options to respond to a scenario in which China's carbon emissions continue at the projected rates.

However, while the United States must continue to seek China's cooperation, there is little chance of progress as long as the United States has no carbon control policy. The International Energy Agency estimates that China will be the world's largest emitter of CO₂ by 2009, but it also projects that on a per capita basis the United States will emit far more than China does for years to come. The ability of the United States to take the lead in the international arena will be severely compromised if it remains unwilling to adopt aggressive carbon reduction policies itself.

ENDNOTES

- 1 Note that this was not a factor in the China National Offshore Oil Company's effort to acquire Union Oil of California. That effort was stymied by U.S. domestic political factors, not by market forces or legitimate national security concerns.
- 2 The European Union has agreed to provide China with technology and funding for a new carbon capture and sequestration coal plant.